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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/787,359	03/16/2001	Akihiro Goto	Q63491	7871

7590 04/28/2003

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EXAMINER

DONG, DALEI

ART UNIT	PAPER NUMBER
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2875

DATE MAILED: 04/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/787,359

Applicant(s)

GOTO ET AL.

Examiner

Dalei Dong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 March 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/787,359.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. Figure 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.

- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,024,622 to Ohoshi in view of U.S. Patent No. 6,525,461 to Iwasaki.

Regarding to claims 1-6, Ohoshi discloses in Figure 20, "the rear glass panel 1 is fixed to a cathode holder 9 on one of inner wall surfaces of an electrolytic cell 8 filled with an electrolyte 7, electrically connecting the gate electrodes 5 to a electrolysis control electrode of a power source (not shown) and electrically connecting the cathode electrodes 3 to the minus terminal of the power source. An anode 10 in form of a Ni plate, for example, is fixed to an anode holder 11 on the opposite inner wall surface of the electrolytic cell 8, and electrically connected to the plus terminal of the power source" (column 5, line 40-50).

Ohoshi also discloses in Figure 20, "composition of the electrolyte 7 may be, for example, 1 part of nickel sulfominate ($\text{Ni}(\text{SO}_3 \cdot 3 \text{NH}_3)_2$), 0.05 to 0.1 part of

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nickel chloride (NiCl.sub.2), 0.1 to 0.15 parts of phosphoric acid (H.sub.3 (PO).sub.4) and 4 parts of pure water (H.sub.2 O)" (column 5, line 51-55).

Ohoshi further discloses in Figure 20, "then, the anode 10 and the cathode electrodes 3 forming the cathode are connected to predetermined potentials, respectively, and the gate electrodes 5 are connected to an intermediate potential between those of the anode 10 and the cathode electrodes 3. Thus, a current is supplied between the anode 10 and the cathode electrodes 3 forming the cathode to electroplate the product. As a result, Ni is deposited on the cathode electrodes 3 to form cathodes 12 inside the cavities 4a. The current may be supplied by any of the d.c. current process, pulse constant current process and constant potential process" (column 5, line 56-66).

However, Ohoshi does not disclose electrode characterized by mixing at least a powder of metal carbide and a powder of metal hydride. Iwasaki teaches in Figure 3A, "The narrow titanium-containing wires 15 are formed of a metal, semiconductor or insulator comprising titanium as a main component, for example, any of titanium, titanium alloys, including titanium-iron and titanium-aluminum, and optional titanium compounds such as titanium oxide, titanium hydride, titanium nitride and titanium carbide. The diameter (thickness) of the narrow titanium-containing wire 15 is generally within a range of from 1 nm to 2 .mu.m, and the length thereof is generally within a range of from 10 nm to 100 .mu.m. Since the form of the narrow titanium-containing wire 15 is influenced by the form of the narrow pore of the porous layer to some extent, the pore diameter of the porous layer, an interval between the narrow pores, and the like are geometrically controlled, whereby the diameter and the like of the narrow titanium-

containing wire can be controlled to some extent, and the growing direction of the narrow wire can also be controlled so as to extend, for example, vertically to the surface of the substrate" (column 5, line 21-40).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilize the titanium-containing material of Iwasaki as the anode electrode of Ohoshi in order to provide a high-performance electron-emitting device capable of emitting electrons in greater amount, furthermore, it is old and well know in the art that titanium hydride is a good getter material, therefore, by including titanium hydride in the anode electrode it would reduce the amount of unwanted gas and prevent future gas release and thus prolong the lifetime of the device.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following prior art are cited to further show the state of the art of manufacturing method of an electrode.

U.S. Patent No. 4,940,300 to Giorgi.

U.S. Patent No. 5,836,796 to Danroc.

U.S. Patent No. 5,860,844 to Susukida.

U.S. Patent No. 5,977,697 to Jin.

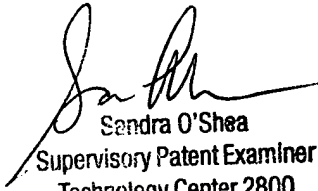
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (703)308-2870. The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703)305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9318 for regular communications and (703)872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D.D.
April 22, 2003



Sandra O'Shea
Supervisory Patent Examiner
Technology Center 2800